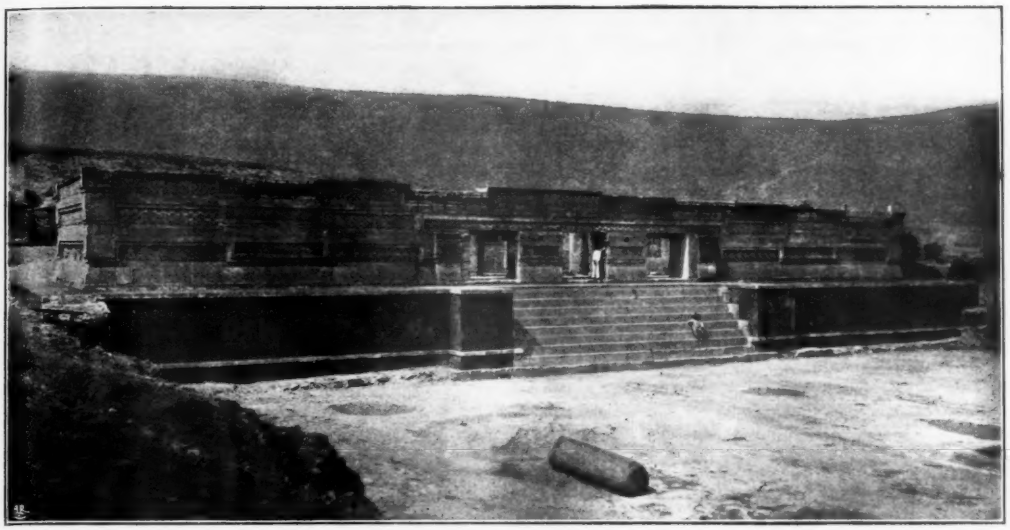


Ruins of Mitla—Principal Façade of the Palace of the Columns. *Photo by C. B. Waite, Mexico.*

THE RUINS OF MITLA, MEXICO.

By Charles Grove Johnson [*F.*], Mexico.

THE famous ruins of Mitla, which constitute one of the most remarkable prehistoric buildings on the American continent, are situated in the region inhabited by the Zapotec tribe, in Southern Mexico, at a distance of about twenty-five miles from Oaxaca, the capital of the State of the same name.

Although the ruins have been visited and described in recent years by such leading archæologists as William H. Holmes, Dr. Edward Seler, Marshall E. Saville, Dr. Nicholas Leon, and others, they have never been measured and drawn by an architect. Viollet-Le-Duc, who describes them in his *Antiquités Américaines*, never actually visited Mexico, but compiled his observations from notes and photographs taken by the French traveller Desiré Charnay.

Thinking that a set of accurate measured drawings * of a prehistoric American building would be of interest to members of the Institute, I visited Mitla in the spring of this year, with the object of making a careful study of at least a portion of the ruins.

I was accompanied by H.B.M.'s Consul, Mr. Lucien Jerome, and Mrs. Jerome, both of whom rendered valuable assistance, the latter being photographer of the party. As the result of our expedition, I obtained sufficient measurements to make the plans of the best preserved building of the group, and to collect the notes which are here submitted.

On consulting the general plan [fig. 1], which is copied from Dr. Nicholas Leon's work on Mitla, it will be seen that there are four groups of ruined buildings (classified as Nos. 1, 2, 3, and 4), which have been indiscriminately named temples or palaces, as their original purpose

* The drawings sent by Mr. Johnson are all given, reproduced to a smaller scale, in the present Paper, with the exception of the longitudinal section of the Patio of Mosaics and Hall of Monoliths, Group No. 3, which cannot be conveniently reproduced in these pages, but which may be seen in the Library of the Institute together with the originals of the other drawings and a number of photographic views of the buildings kindly presented by Mr. Johnson.—Ed.

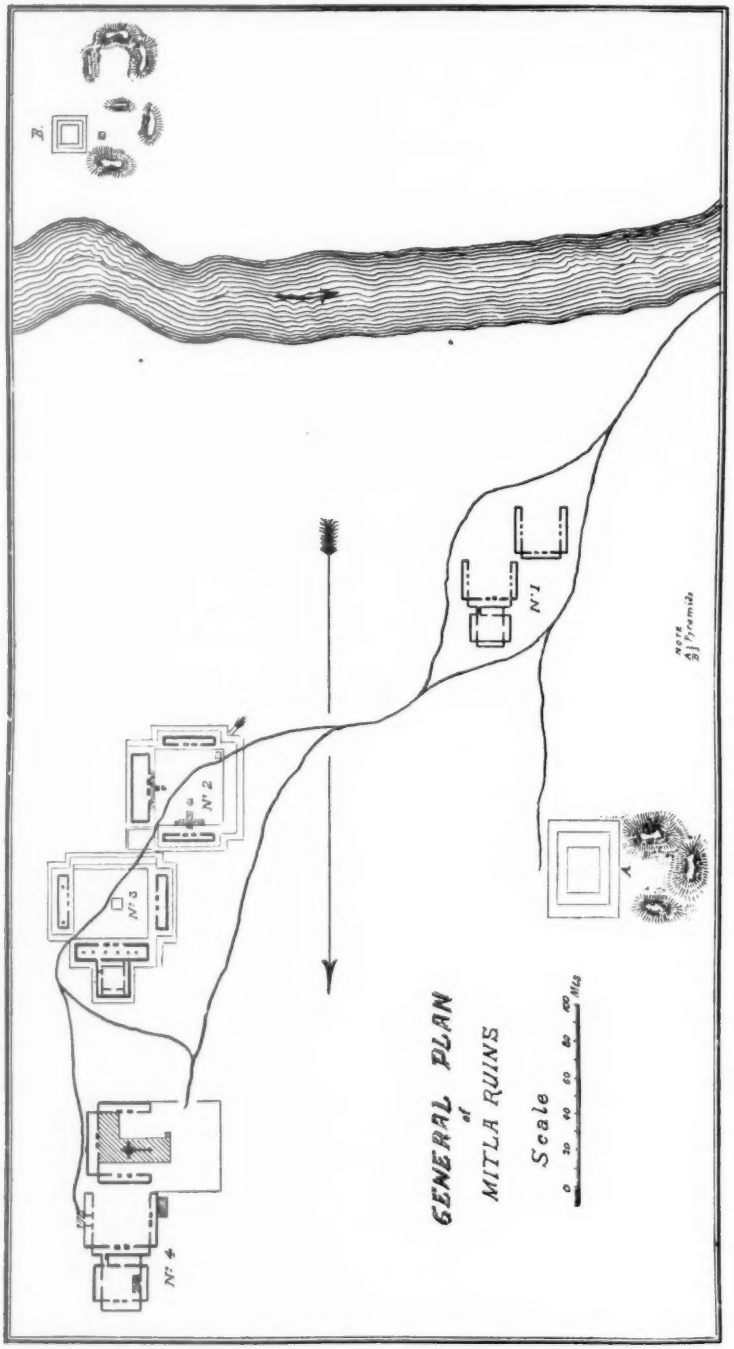
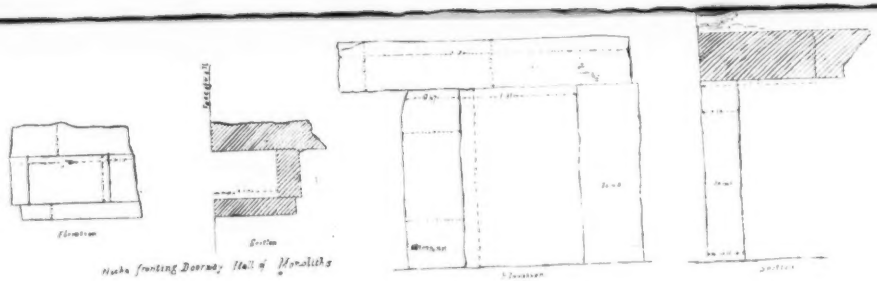


FIG. 1.—GENERAL PLAN OF THE MITLA RUINS.

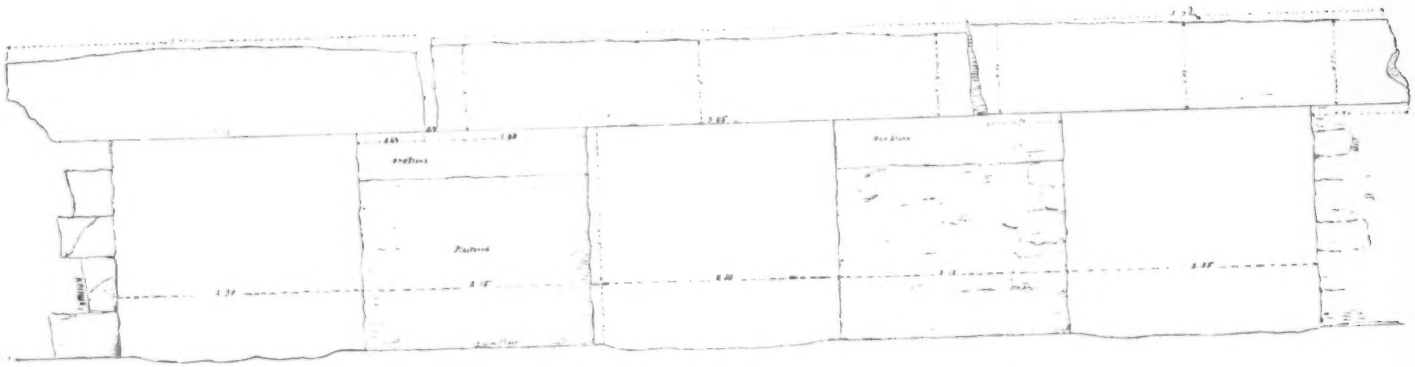


Huaka fronting Doorway Hall of Monoliths

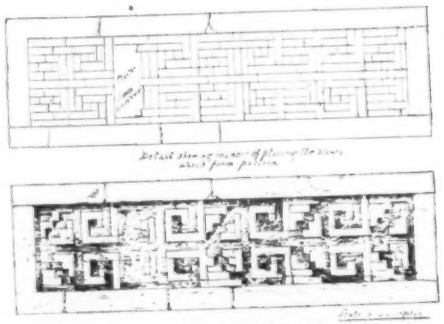
Section of Drain Tunic Group No 2

Section of Cut Stone Drain Tunic Group No 1

Drain leading from Hall of Monoliths to Pascana

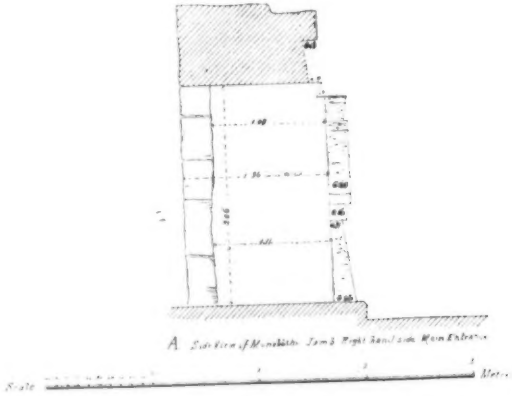


Back view of Outside Wall of Monoliths



Detail showing manner of placing the stones which form pattern

Detail of Panel of Plaster Inlay on Jamb of Entrance to Hall of Monoliths



A Side View of Monolithic Jamb Right hand side Main Entrance

Scale 0 1 2 Meters

Measured and drawn by Charles Owen Johnson Architect Mexico

FIG. 2.

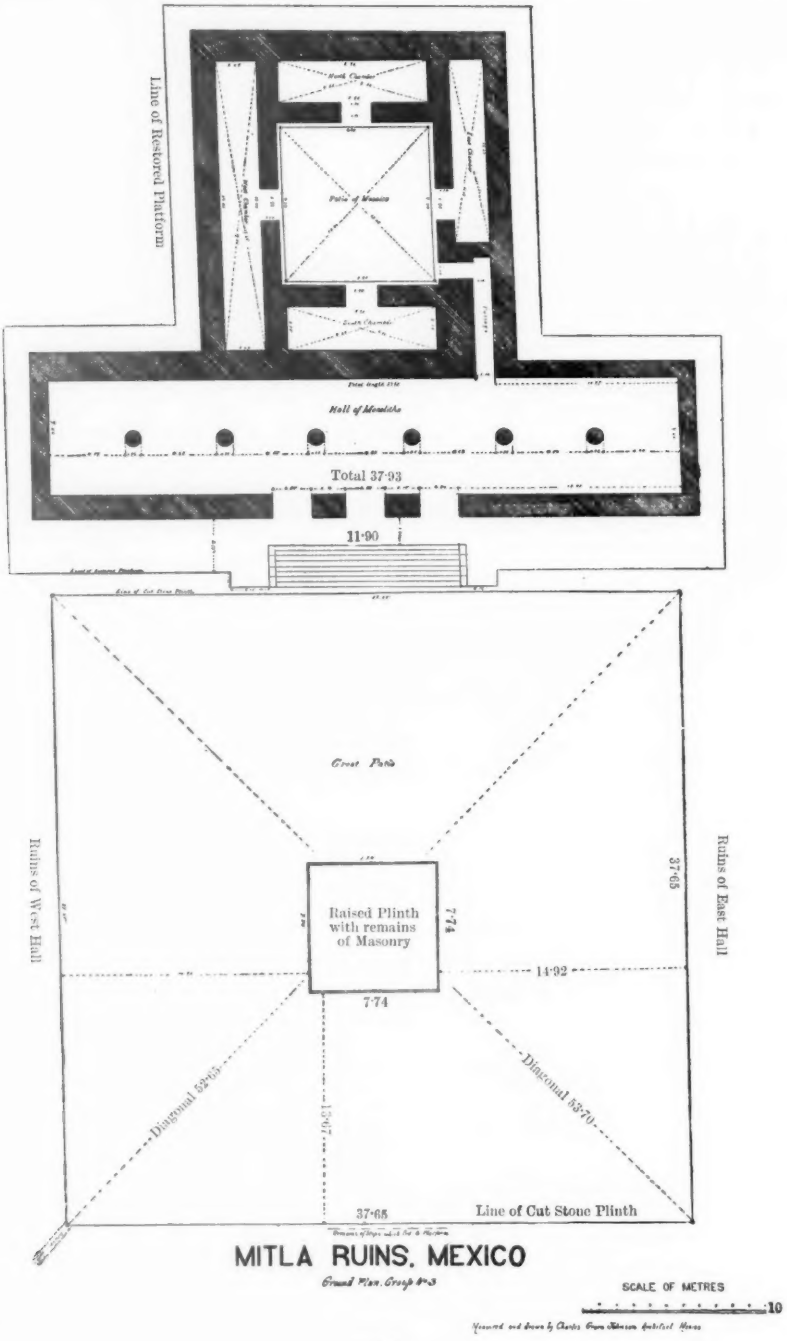

Line of Restored Platform
Hall of Monoliths
Total 37·93
11·90
Great Patio
Raised Plinth with remains of Masonry
7·74
14·92
37·65
Ruins of West Hall
Ruins of East Hall
Diagonal 52·65
Diagonal 53·70
19·67
37·65
Line of Cut Stone Plinth
MITLA RUINS, MEXICO
Ground Plan. Group No 3
SCALE OF METRES
10

FIG. 3.

has not yet been determined, besides two pyramids or artificial mounds, which are marked A and B. The orientation of all the buildings is the same, being almost due north and south.

Each group consists of one or more courtyards, entirely or partly enclosed by long narrow chambers, which are raised on high platforms. Access to these chambers was gained only from the courtyard and by means of steep steps, of peculiar and characteristic section.

The following brief survey of each group may be of interest:—

Group No. 1.—The buildings of this group have not yet been excavated, and are buried in sand almost to the level of the soffit of the lintels of the doorways. The remains of hieroglyphic paintings which still decorate the face of the lintels are of particular interest, and have been published in colours by Dr. Seler. They are similar in style to the Mexican codices, some fine examples of which are preserved at the Bodleian Library at Oxford. I noticed that in the case of these wall paintings the surface of the smooth stone has been carefully covered with a thin coat of very fine plaster, on which the figures are outlined in Indian red.

Group No. 2.—The original appearance of a Mitla palace is best realised in this group. On entering its spacious courtyard, the three halls are seen standing complete on the north, south, and east sides, each with its triple doorway spanned by massive stone lintels. There are indications that the platforms on which these buildings are erected were originally in two stages, and of pyramidal section. The courtyard was cleared by Marshall Saville, who laid bare its original cement pavement. Only fragments remain of the cut stone facing which once covered the walls of the chambers, and also of the platforms and stairways. An interesting feature is the large drain, of which I give a drawing [fig. 2], and which is situated on the south-west corner of the courtyard. Its outlet is clearly visible on the exterior wall of the enclosure. This group is remarkable for the two subterranean cruciform chambers which exist under the north and east halls. One of these was discovered by Mr. Saville, who determined that they were sepulchral chambers, similar to those discovered at Xagá and Guiaroó, in the vicinity of Mitla.

Group No. 4.—The buildings of this group have suffered much, as for years they have been occupied as dwellings, and altered to suit the requirements of the Catholic Church. Originally there were three courtyards (*a*, *b*, *c*), in the first of which the parish church is built, its walls being mainly composed of dressed stones which have been torn from the ruins themselves.

Court *b* has now been turned into a residence for the parish priest. The entrance on the east side has been made by opening a doorway in the back wall of the original chamber, in front of which two ancient columns have been set up to form a porch. The latter must have belonged to either the east or west chamber of Group No. 2, as there is no evidence of any columns having been employed in the group of which we are now treating. The other chambers of this court have been altered in different ways to render them habitable.

The third inner court (*c*) was originally entered by a narrow passage from the back of the north chamber of Court *b*, a characteristic feature of the planning of the Mitla palaces which occurs also in Groups 1 and 3. This court is in a still more deplorable condition than the other two, for it is used as a stable and barnyard.

On the lintels of the doorways are remains of hieroglyphic paintings, which have also been published by Dr. Seler. These and the paintings in Group No. 1 constitute the only representations of living forms which have been found in the ruins.

Enough remains of the mosaic panels to reveal the former treatment of the wall surface, which is similar to that of Group No. 3.

Group No. 3 [fig. 3].—This, the most important portion of the ruins, consists of the great courtyard and an inner court, which is situated behind the North Hall, known as the Hall of Monoliths, or Columns. The Great Court measures 37·65 m. by 37·65 m. Its four sides are

equal, but, as demonstrated by the diagonal measurements, it is out of square. It has been cleared, and the original cement pavement is intact. In the south-west corner there is a cut stone drain, of which I give a section [fig. 2]. The pavement was sunk at the outlet of the drain, and the edges of the channel thus formed were carefully rounded off. Near the centre of the court is a raised plinth of cut stone which measures 7·74 m. by 7·74 m., and is 0·25 m. in height; it also is out of square. The remains of stone and adobe which are found on this raised space indicate that a small pyramid or sacrificial altar once stood here.

The court was formerly surrounded on the north, east, and west sides by three halls, and on the south side there are remains of a platform, with steps leading to it, which was originally the same height (3·15 m.) as the sub-structures of the other three sides on which the halls are built. Although in the restoration of the platform of the Hall of Monoliths, made for the Mexican Government, the sides are vertical, I am inclined to believe with Mr. W. Holmes that they were originally pyramidal in section—at least, on the inside of the enclosure.

FIG. 4.—RUINS OF EAST HALL, GROUP NO. 3, SHOWING FALLEN LINTEL.
Photo by Mrs. Lucien Jerome.

The view of the East Hall forms the most picturesque portion of the ruins, its beauty being enhanced by its isolated standing columns and the great fallen lintel at the base of the platform. One lintel of the triple doorway still remains in place, though badly cracked and about to fall to pieces. Only a small portion of the walls remains standing, but it suffices to show that the façade of this hall was identical with that on the north side [fig. 4].

The ruins of a platform stand on the west side of the court, and are much overgrown with vegetation. Three stones of its plinth are still in place, and a monolithic stone column, which undoubtedly once belonged to the West Hall, lies in the courtyard [see *headpiece*, p. 513]. Remains of the cement pavement of the chamber are noticeable on the summit of the platform.

On account of its remarkable state of preservation and its harmonious colouring, in which rose and yellow tints prevail, the façade of the Hall of Monoliths on the north side of the courtyard is the most impressive of all the Mitla buildings. It undoubtedly presents a perfectly harmonious and refined architectural composition.

With the exception of the entrance, facing the Great Court, the exterior is devoid of openings. The wall surface of cut stone is almost intact, and is divided up into the characteristic panels filled with geometric ornaments, which continue in an unbroken series round the entire building. The quoins are made to stand out boldly by means of square blocks of stone, which on analysis prove to be merely filled-up panels.

To quote the opinion of Viollet-Le-Duc: "The monuments of the golden age of Greece and Rome alone equal the beauty of the masonry of this great building. The facings dressed

with perfect regularity, the well-cut joints, the faultless bends, and the edges of unequalled sharpness bear witness to knowledge and long experience on the part of the builders."

The triple portal [fig. 5] spanned by huge stone lintels, the largest of which measures 5·05 m. by 0·80 m. by 1·30 m., gives entrance to its spacious hall the roof of which must formerly have been supported by the six monolithic columns which are still standing [fig. 6].

In the wall, facing the main entrance, is a small niche, of which I give a drawing [fig. 2, p. 515]. Similar niches face the entrances of all the Mitla halls, and may have been intended to hold an idol, with a small brazier of the copal gum which was burnt as incense.

Close by the niche is the entrance to the narrow passage [fig. 7] which, with a sudden turn at right angles, leads to the secluded inner court, popularly called the Patio, or Court-yard of Mosaics.

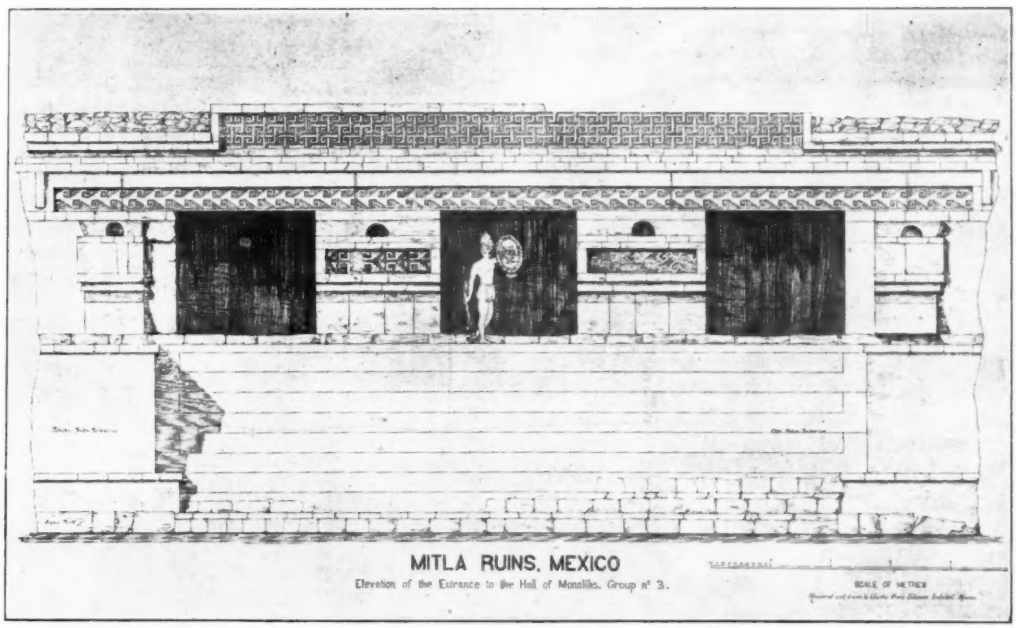


FIG. 5. *Measured and Drawn by Charles Grove Johnson (F.*

The stones which form the roof of this passage are carefully dressed, and measure in width from 0·70 m. to 0·90 m. I was unable to obtain their section, but they are probably similar to the lintel which spans the entrance to the passage, of which I give a measured drawing [fig. 2] and photograph [fig. 7]. It will be seen that this lintel measures 2·76 m. long: its depth is 0·53 m., and width 1·08 m. The doorway has monolithic jambs, which measure 1·70 m. high by 0·54 m. wide. This roof, and those in the narrow passage of Group No. 1, and in the subterranean chambers of Group No. 2, constitute the only remaining examples of the primitive method of roofing.

Surrounding the patio are four narrow chambers which were formerly lighted by the doorways only. It must be borne in mind that the amount of light derived from such an opening is much greater in the brilliant light of the tropics than it would be in the north. In Spanish buildings, as also in ancient Pompeii, the rooms giving on to the patio have commonly

FIG. 6.—HALL OF MONOLITHS, GROUP NO. 3.
Photo by Mrs. Lucien Jerome.

no other light than that admitted through the doorway. The modern Mexican hut has usually only one door, and ordinary occupations, such as cooking and sewing, are carried on at the threshold. The rooms are raised about 25 centimètres above the level of the patio, leaving at the entrance a rather high step, which difference of level would not have prevented the rooms from being flooded during the rainy season, unless the court had drains, of which, however, I failed to discover any trace.

The walls of the patio are decorated with what has been described as the characteristic mosaic-work of Mitla [fig. 8]. The term "mosaic" does not convey a true idea of these geometric ornaments, which are formed by embedding in the wall flat pieces of cut stone, the projecting edges of some of which form the pattern. The method used is somewhat analogous to that of ornamental brick-work, but, instead of being formed of stone bricks of uniform size, the laborious process has been adopted of cutting each stone separately to fit its place.

The geometric patterns thus formed are framed in panels, and with great ingenuity and skill were never repeated in the same position. Each wall of the patio, therefore, presents a pleasing variety of fresh combinations of the same designs.

In order to convey an exact idea of the peculiar and painstaking method employed, I have drawn and measured every stone of one of these panels—namely, that of the left pier of the centre doorway of the Hall of Monoliths. I submit two drawings of it [fig. 2].

A good effect of light and shade on the wall surface is obtained by the projecting and receding courses of masonry which divide the panels.

The treatment of the wall space in the

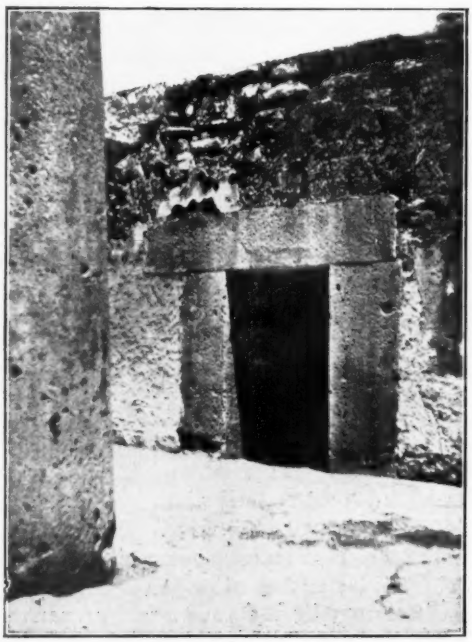


FIG. 7.—DOORWAY OF PASSAGE FROM HALL OF MONOLITHS TO PATIO OF MOSAICS.
Photo by Mrs. Lucien Jerome.

surrounding chambers is distinct from anything else in Mitla, the panelling being omitted. The walls have been plastered to a height of 1·30 m. from the ground, thus forming a dado. The remains of this plaster adhering to the west chamber are highly polished and of a rich Indian red colour. The mosaic patterns above the plain dado run continuously round the walls, and are divided only by small horizontal courses of cut stone.

Photo by C. B. Waite, Mexico.

FIG. 8.—SOUTH-WEST CORNER OF THE PATIO OF MOSAICS.

It is obvious that the only difficulty which presents itself in running a continuous pattern round a square chamber is its adjustment at the corners. The way the Mitla artists solved this problem was by re-turning the pattern round the corners, as though he had taken a roll of matting and nailed it to the wall [fig. 9]. It was interesting for me to find that while three corners were thus successfully treated, the pattern did not come together at the fourth [fig. 10].

Mrs. Zelia Nuttall, who has made a special study of Mexican archæology, has pointed out

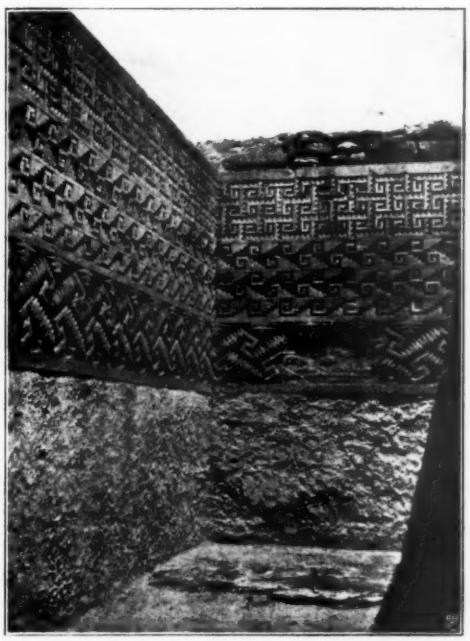


FIG. 9.—DETAILS OF THE CHAMBERS OF THE PATIO OF MOSAICS, SHOWING THE RETURN OF THE PATTERN ROUND THE CORNERS OF THE ROOMS.

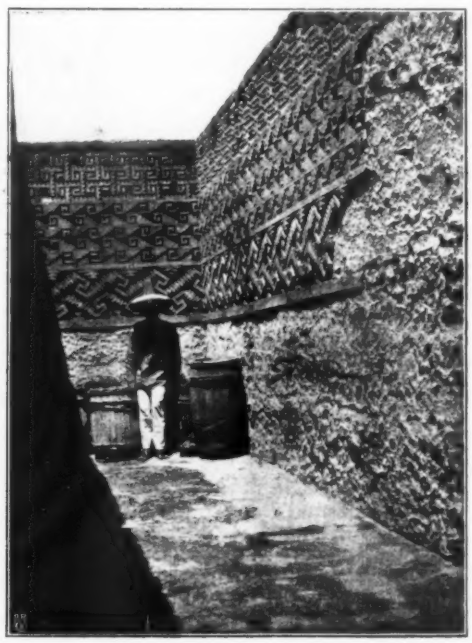


FIG. 10.—EAST CHAMBER OF THE PATIO OF MOSAICS, FOURTH CORNER PATTERN DEFECTIVE.

Photos by Charles Grove Johnson.

to me that the forms of all the Mitla designs resemble those employed in the primitive arts of basketry and rush-weaving. It is indeed remarkable how closely the designs of the modern native rush mats resemble the geometric patterns of Mitla. As Mrs. Nuttall remarked, the ancient custom of hanging mats on the walls may well have suggested the idea of reproducing this form of decoration in painted stonework. In this connection it is interesting to note that Francisco de Burgoa, a Dominican monk who visited Mitla in 1674, records that "all its halls were covered with mats and were very clean."

Having now given a general description of the ruins, I will proceed to describe in detail the method of construction and the materials employed.

Substructures.—As already mentioned, the platforms appear to have been pyramidal in section and are made of rubble stone laid in clay mortar. In some cases they were faced with cut stone, in others merely plastered. In Group No. 2 these were evidently in two stages. The fact that there is no break in the stone plinth of the patio, which exists in perfect condition, proves that they were originally coalescent in their lower plane; their upper plane, however, must have been disconnected at the four corners, in order to afford entrance to the enclosure.

FIG. 11.—DETAIL SHOWING THE MOSAIC PATTERN CARVED ON THE SOLID LINTEL.

Stairways.—In Group No. 2 I traced the steps which led to the court from three of the outer corners of the platforms; on the fourth side their place is occupied by the outlet of the drain, which has already been described and illustrated. These steps, like those which remain of the great stairway which led to the Hall of Monoliths, are remarkably steep and inconvenient. They are pyramidal in section, and their tread is so narrow that there is barely room to place the foot. They are not cut out of a solid block, but are formed of two flat stones about 0·12 m. thick, one of which forms the riser and the other the tread.

From the remaining steps which lead from the outside to the courtyard of Group No. 2 I am led to infer that entrance was obtained to the enclosure in the following peculiar manner. Access to the first stage of the platform having been gained from the outside at the corners, one had to walk along this plane to the centre of the terrace, where one encountered the great stairways. It is evident that by this means it would have been exceedingly easy to defend the entrances to the enclosed court in times of war, when the temples served as fortresses. Mrs. Zelia Nuttall has suggested that the peculiar steepness of the stairways may have been planned in order to render a hostile attack more difficult. In the history of the conquest there are many accounts of the disasters experienced by the Spaniards in scaling the precipitous steps of the Mexican temples.

Walls.—The stone used throughout the building is trachite, the ancient quarries of which have been discovered in the neighbouring hills.

The massive core of the walls of Mitla is made of rubble stone, imbedded in the adhesive clay of which the "adobes" or sun-dried bricks, extensively used in Mexico, are made. In the passage leading from the Hall of Monoliths to the Patio of Mosaics I found evidences that the coarse grass known as "zacaton" had been mixed with the clay in order to render it more binding.

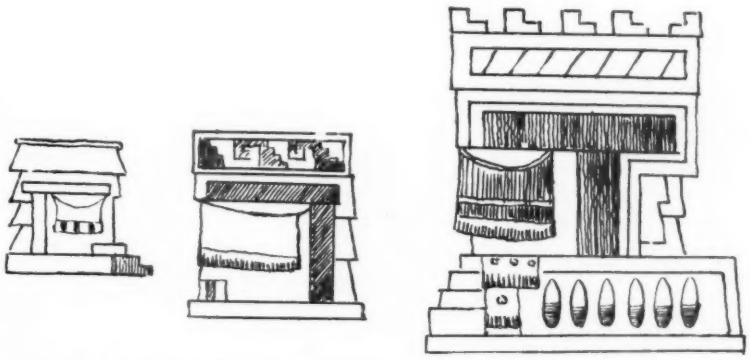


FIG. 12.—MANNER OF HANGING A CURTAIN BEFORE A DOOR, FROM THE MEXICAN CODICES

In nearly all of the buildings the rubble core was faced with cut stone, which was carefully bonded and so closely fitted together that a penknife can hardly be inserted between the joints, in which, strange to say, there are no traces of mortar; yet the ancient builders well understood the art of mixing lime and sand to make mortar, although they appear only to have used it in the walls as a thin coating of plaster with which the whole surface of the stonework was covered and partially painted. Further proofs of their skill and knowledge in making mortar are their admirable pavements, which are as hard as modern cement, and appear in many places to have been coloured Indian red.

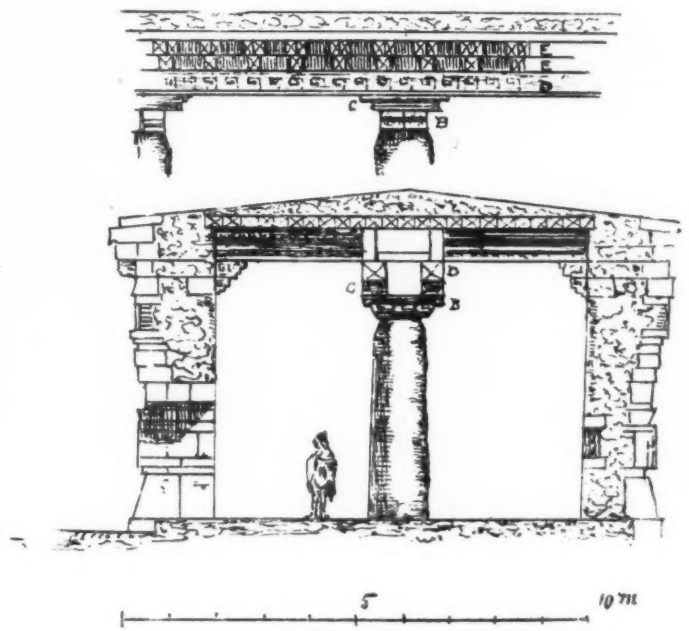


FIG. 13.—SECTION OF THE HALL OF MONOLITHS, AS RESTORED BY VIOLLET-LE-DUC. (*Antiquités Américaines*, p. 79.)

It was interesting to note in the great court of Group No. 2 traces of guide-lines running from side to side, showing that the pavement was laid in sections of about one mètre and a half wide. In one place I observed three successive layers of cement, each layer retaining its bright red surface, which leads to the inference that the pavement had been renewed at different times.

The interior walls of the Hall of Monoliths and other places where the stone face was omitted were finished with a coat of plaster.

Wall Painting.—The paintings on the stone lintels in Groups No. 1 and No. 4 have already been alluded to. There are proofs that at one time the whole of the beautiful stone-work of Group No. 3 was painted, the background of the mosaics being red and the raised pattern white. Certain fragments of the painted plaster coating, which is very thin, show a highly polished surface, which almost gives the effect of oil paint.

Doorways.—We have already mentioned that the doorways are invariably spanned by monolithic lintels, of which I obtained the true section from the one lying in the courtyard of Group No. 3 [fig. 4]. All Spanish writers agree that doors were unknown to the ancient Mexicans. The native picture writings furnish illustrations of temples with hangings suspended across the doorways [fig. 12]. It is evident that the same method was employed at Mitla, for in the centre of each pier, about 1·60m. from the ground, there exist round holes which appear to have been made for the purpose of inserting the end of a pole or some contrivance to which a cord for stretching the hangings was attached.

The Roof.—Opinions differ greatly as to how the buildings of Mitla were originally roofed. Viollet-Le-Duc's conjectural reconstruction of the roof of the Hall of Monoliths is unquestionably fanciful and un-American in style [fig. 13].

The only authentic information we possess on the subject of prehistoric roofing is contained in the Mexican codices, illustrations from which have been furnished me by an archæological friend [figs. 14 and 15]. These prove that some temples had high thatched roofs, while others were flat, presumably in the same style as the modern Mexican "azotea." The fact that rows of columns were placed down the centre of the Great Hall of Group No. 3 excludes, in my opinion, the supposition that they had thatched roofs; we may therefore surmise that the roofs were flat, but no remains of any sort exist to enable us to form an opinion as to the method of construction adopted.

It will be seen on referring to the ancient drawings of flat-roofed temples [fig. 14] that they usually display below the parapet a series of circles. These surely indicate the projecting poles which formed the ceiling joists, the round ends of which seem to have been allowed to project beyond the wall and to have been painted and decorated, on the sound principle of not constructing ornament but of decorating construction.

In a number of instances embattlements of different forms are shown as a finish to the building. Although no traces of them remain, it seems more than probable that similar indented parapets once surmounted the buildings of Mitla.

In connection with the pre-Columbian thatched roof, it is interesting to observe that its direct descendant is used at the present time in the little village of Mitla.

On examining the hut of which an illustration is given [fig. 16] I found that the principal rafters were formed of poles, round which purlins of cane were tied. This framework supported the thatch, which was made of the leaves of the same cane or native bamboo, and laced with thin cords of agave fibre.

A few words concerning the tools and standards of measurement which were employed in ancient Mexico may be of interest. In the neighbourhood of Mitla bronze chisels and axes, chipped flint and obsidian knives, and stone hammers have been unearthed, and we learn from native drawings and the Spanish historians that wood mallets were in common use. We must therefore conclude that the perfect masonry of Mitla was executed with these primitive instruments, to which may perhaps be added, in the case of great blocks of stone, the laborious process of cutting by means of cord made of agave fibre, used in combination with water and sand. In order to dress the face and edges of the stone the native work-

men must have ground one stone upon another, just as their descendants do at the present day.

The huge monoliths were probably raised on inclined planes by means of rollers, with great expenditure of human labour.

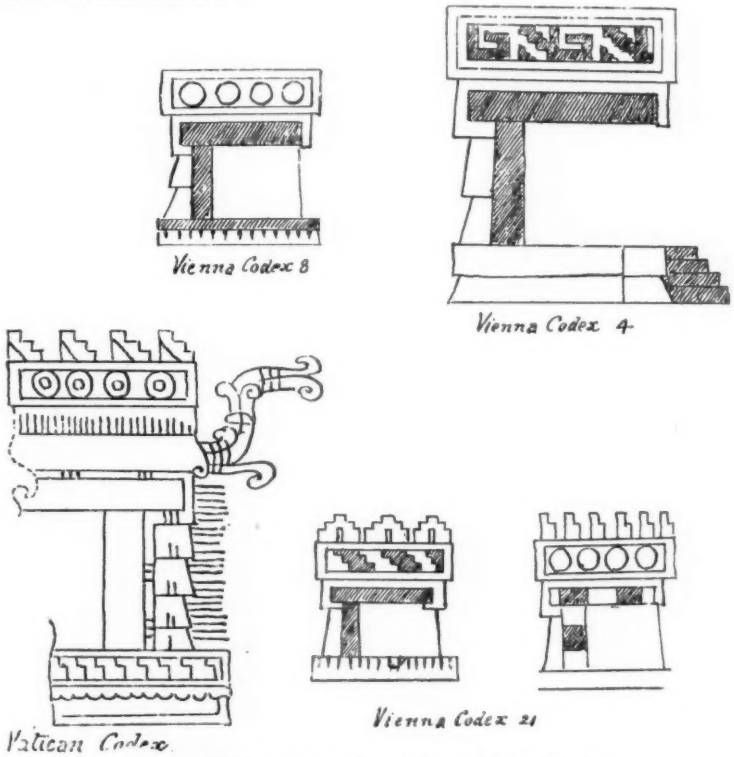


FIG. 14.—TEMPLES WITH FLAT ROOFS, FROM THE MEXICAN CODICES.

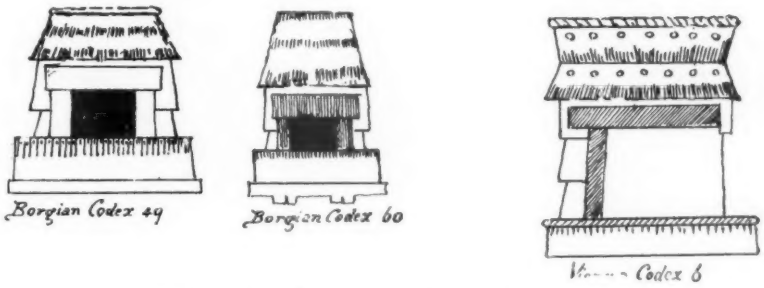


FIG. 15.—TEMPLES ROOFED WITH THATCH, FROM THE MEXICAN CODICES.

The following extract from Daniel G. Brenton's *Essays of an Americanist* shows that the ancient Mexicans were unacquainted with the use of the plumb line:—

"The plumb line must have been unknown to the Mexicans; they called it 'Temetztepilolli,' 'the piece of lead which is hung from on high, from *temeztli*, lead, and *piloa*, to

fasten something high up.' Lead was not unknown to the Aztecs before the conquest. They did not esteem it of much value, and their first knowledge of it as a plummet must have been when they saw it in the hands of the Spaniards."

The codices show that cords, invariably stretched by two individuals, were used either for measurement or guide lines. As in the case of all primitive people, the Mexican standards of measurement were derived from parts of the human body. According to Brenton's authority, it was the foot measure that was adopted as the official and obligatory standard, both in commerce and architecture.

Instead of inferring, as some archæologists have done, that the marked asymmetry of all the Mitla buildings was intentional,* I am inclined to attribute it to a rudimentary knowledge of geometry. Considering that these primitive buildings did not succeed in setting out square a single court or chamber, it is all the more remarkable that they were able to execute with such perfection the complex geometric ornaments which constitute the most characteristic feature of Mitla architecture. .

In conclusion, I will express the hope that the above observations on a building which is one of the best existing examples of prehistoric autochthonous American architecture may be of use, not only to architects, but to archæologists.

* C. Louis H. Ayme (quoted in "Notes on Mitla"), *Proceedings of the American Antiquarian Society*, April 1882.

FIG. 16.—MODERN THATCHED HUT IN THE VILLAGE OF MITLA.

9, Conduit Street, London, W., 24*th Sept.* 1904.

CHRONICLE.

British Museum Extension.

The correspondence which has passed between the Council of the Institute and His Majesty's Office of Works with reference to the proposed enlargement of the British Museum is printed herewith for the information of members :—

9, *Conduit Street, W.: 3rd Nov.* 1903.

To the Right Hon. Lord Windsor,
First Commissioner of His Majesty's Works.

My Lord,—The attention of the Council of the Royal Institute has been drawn to the fact that very large works are in contemplation for the enlargement of the British Museum on a site recently acquired for that purpose.

We are directed by the Council respectfully to express to your Lordship their desire to urge strongly upon His Majesty's Government that the Architectural profession should be consulted in the case of a work of such national importance, as has usually been done in similar previous cases.—We have the honour to be, your Lordship's most obedient servants,

Alexander Graham, *Hon. Secretary* ;
W. J. Locke, *Secretary.*

29*th March* 1904.

To Aston Webb, Esq., R.A., President R.I.B.A.

Sir,—I am directed by the First Commissioner of His Majesty's Works, &c., to inform you that he has had under careful consideration the representation of the Council of the Royal Institute of British Architects dated the 3rd November last with reference to the proposed enlargement of the British Museum.

I am to state that it has been decided to extend the accommodation of the Library and Reading Room of the Museum, and such extension is to be provided by a building on the north side with a frontage on Montague Place ; and I am desired by Lord Windsor to lay before you and the Council of the Institute the following proposals of His Majesty's Government :—

The elevation of the building should form part of the design of one which will ultimately occupy the whole area of the ground enclosed by the present Museum on the south, Montague Street on the east, Montague Place on the north, and Bedford Square and Bloomsbury Street on the west, although the further completion of the building is not contemplated, nor is it likely to be required, for many years.

After fully considering the question the Government have decided to adopt the same method for the selection of an architect for this building as was followed in the recent case of the new Public Offices, and I am to enquire whether the Royal Institute of British Architects will be prepared, as in that instance, to assist the Government in obtaining a selection of the best architectural talent available by nominating a limited list of not less than six architects of taste, skill, and efficiency in classical design who would in their opinion be the best qualified to carry out a work of this importance.

It should be understood that the architect selected by the Government would be appointed subject to the condition that in the preparation of plans he would have to follow, in their internal arrangements, the lines laid down by this Department.

It is essential that the elevation should be designed generally in the same style as and should harmonise with Smirke's façade in Great Russell Street ; but, subject to this condition, there is scope for some variation in the treatment, which would lend additional interest to the other three important frontages.

The building should be constructed externally entirely of Portland stone.

It is suggested that, as in the case of the former nomination of architects by the Institute, the list of nominees might conveniently be accompanied by a statement of the names of one or more of the most important of the buildings erected by each in the required style, together with any existing illustrations or photographs thereof.—I am, Sir, your obedient servant,

Schomberg R. McDonnell.

The Council, having given the most careful consideration to the important task the Government had entrusted to them, nominated seven architects,* illustrations of whose works were thereafter submitted to the Government.

Intimation of the Government's selection of Mr. J. J. Burnet to prepare plans for the proposed extension has been conveyed to the Council in the following letter :—

* The process of selection of these architects by the Council was explained by Professor Beresford Pite at the Annual General Meeting last May [Journal, 7th May, p. 370].

17*th August* 1904.

SIR,—I am directed by the First Commissioner of His Majesty's Works, &c., to inform you that after a very careful consideration of the names of the architects which your Council were good enough to submit for their guidance, His Majesty's Government have selected Mr. J. J. Burnet to prepare plans for the proposed extension on the north side (with a frontage to Montague Place) of the British Museum.

This decision has been arrived at after a prolonged enquiry and after examination of the drawings and photographs forwarded by the Institute in support of the list of names submitted.

I am desired to express on behalf of the First Commissioner his gratitude to the President and Council of the Institute for the invaluable assistance they have afforded in enabling His Majesty's Government to arrive at a decision upon a matter involving much difficulty and responsibility.

I am to add that the drawings and photographs are being returned to the individual architects with a letter of thanks from the Board.—I am, Sir, your obedient servant,

The Secretary R.I.B.A. J. FITZGERALD.

Seventh International Congress of Architects.

His Royal Highness the Prince of Wales has graciously signified his acceptance of the position of Honorary President of the Seventh International Congress of Architects to be held in London in 1906.

The Annual Dinner.

The Council have deemed it advisable to postpone the proposed visit and holding of the Annual Dinner of the Institute at Newcastle this year. All arrangements published in previous issues are consequently cancelled.

Sessional Papers 1904-5.

Arrangements are in progress for the reading of the following Papers at the Institute during the coming Session:—

Nov. 21.—Concrete, by L. G. Mouchel (agent for Hennebique's Patents); The Construction and Strength of Reinforced Concrete, by Wm. Dunn.

Dec. 19.—Architecture and Building Acts, by Lacy W. Ridge [*F.*] and James S. Gibson [*F.*].

Jan. 23.—European Architecture in India, by James Ransome [*F.*].

Feb. 20.—Architectural Education, by Reginald Blomfield, M.A.

March 20.—Decorative Painting, by Sir Wm. Richmond, K.C.B., R.A. [*H.A.*], and other artists.

April 3.—The Planning of Cities and Public Spaces, by John W. Simpson [*F.*]; The Architectural Improvement of London, by Professor Beresford Pite [*F.*].

April 17.—The Garden and its Accessories, by Mervyn Macartney, M.A.

May 15.—Sculpture and Architecture.

The A.A. Schools.

Mr. T. Frank Green [*A.*], master of the newly established Evening Continuation School of the Architectural Association, briefly sketches in the current *A.A. Notes* the work to be done in the classes under his supervision. The Continuation School has been started in order that students who have finished their two years' course may be able to continue their studies in the evening without a break.

The inauguration of this school (Mr. Green writes) will enable the master of the Day School to put into effect several changes which have been impracticable while the second year's study finished the course, so that more time may be given to making a solid foundation upon historical work and more consideration given to construction, some work now undertaken in the last terms of the second year being left over for the Continuation School.

The work of third-year students will consist of working out subjects in design somewhat in advance of their previous work, and special attention will be given to planning, both for convenience and architectural effect. The constructional and hygienic problems connected with each subject will also receive adequate attention, and, as far as possible, construction will be dealt with in connection with the designs worked out.

Perspective drawings will be made of the subjects designed, and the finishing of these in various media will be touched upon, since the importance of being able to make a drawing which will give accurate ideas of the finished building can hardly be over-estimated.

Subjects will be set involving the consideration of designing in mass rather than in detail, and small-scale sketches of large subjects will occasionally be given in order to impress upon students the prime importance of having an "idea" when designing. Students will also be directed to consider Building Acts, By-laws, &c.; design subjects being set to touch these matters with the view of enabling students in their fourth year to take full advantage of the lectures on these subjects.

The study of ornament will be combined with the drawing of it, and subjects in the design of ornament will occasionally be set. Time sketches of ornament will be required both to be drawn from the cast and designed, and students will not be confined to the use of other materials than "Whatman" and "Conté crayon." Short addresses will be given upon the work in hand and on other subjects whenever it is thought that these will be helpful.

In the fourth year more advanced subjects will be set for design. The study of colour as related to buildings will be commenced, and something more ambitious will be attempted in the preparation of working drawings and details. It is hoped that the curriculum may be made to include some instruction as to prices and the supervision of building work, the lectures on professional practice being open to students. The science of lighting, heating, ventilation, and sanitation will be dealt with in this year, the chemistry of building materials forming part of the course.

The writing of reports and descriptions of buildings will be practised, and, if time permits, specifications of one of the subjects set will be worked out in continuation of work of this nature done in the Day School. In both the third and fourth years particular attention will be given

to the study of "*old work*," which students are able to undertake outside the school, both during term and vacations.

Mr. Green points out that the Continuation School will in no way trench upon the evening classes and lectures now in existence, but will, by keeping past students of the Day School together, enable them, under the direction of the master, to take fuller advantage of these classes than would be possible if left to their own devices at the end of their second year.

Plenum Ventilation and Royal Victoria Hospital, Belfast.

The Editor has received a communication from Mr. Bibby in reply to the statement of Messrs. William Henman & Thomas Cooper and Messrs. Henry Lea & Son, which appeared in the issue of the 17th August. The Editor regrets that it is impracticable to insert this communication or a sufficient extract in the present issue of the JOURNAL, but the matter will receive attention in the next issue.

The Formation of Suburbs.

In a letter to *The Times* Mr. T. C. Horsfall, referring to an article in *The Times* on "The Formation of London Suburbs," points out that the care which ought to be taken to insure for London that its suburbs shall be not only healthy but sightly has long been taken for Berlin and other German towns by their authorities. From the point of view of care for the public health it is there regarded as a well-founded demand that the buildings of a large city shall continuously diminish in closeness as one leaves the centre, so that fresh air may pass from the country into the interior of the town with the least possible hindrance.

The building regulations for the suburbs of Berlin, which apply to a very large area, some parts of which are more than twenty miles from the centre of Berlin, limit the height of the buildings and the proportion of the sites which may be covered with building. Different heights and different degrees of closeness of building are allowed in different districts. In a few districts near the centre five stories are allowed. In other large districts only detached or semi-detached houses, not exceeding three stories in height, are permitted. On the west side of the town, the side from which the prevalent winds blow, a larger proportion of the area is reserved for "open" building than elsewhere.

All large German towns, and some towns which are not large, prepare building plans to regulate the growth of their suburbs. These plans provide that the principal streets shall be very wide and that some of them shall be planted with trees, that there shall be a good many planted open spaces, and that some parts of the suburbs shall contain only detached and semi-detached houses. It is considered desirable that the building plan for a town shall show how all the land which is likely to be needed for the next ten or twenty years is to be laid out. Many books dealing with the subject of town extension plans have been published of late years in Germany. The pioneer book was "Stadt-Erweiterungen," by Professor R. Baumeister, of Karlsruhe, which was published in 1876, and is still regarded as a standard work.

REVIEWS.

PHYLAKOPI.

Excavations at Phylakopi. Conducted by the British School at Athens. 280 pages, with 41 plates and 193 illustrations in the text. Published by the Society for the Promotion of Hellenic Studies. Price 30s. net. [*Macmillan & Co., Ltd.*]

This volume is published as Supplementary Paper No. 4, and embodies the results of the excavations 1896–1899 described in a series of papers as follows: "Introduction" and "Bronze Statuette," by Cecil Smith; "The Excavation," by D. G. Hogarth; "The Architecture," by T. D. Atkinson; "The Obsidian Trade" and "Wall Painting," by R. C. Bosanquet; "Minor Antiquities," by R. C. Bosanquet and F. B. Welsh; "The Pottery," by C. C. Edgar; "Pottery Marks," by A. J. Evans; "The Successive Settlements of Phylakopi," by D. Mackenzie. Drawings by T. D. Atkinson, Halvor Bagge, E. Gilliéron, and T. D. Fyfe. The text is fully illustrated by drawings and photos, and the plates include two excellent plans in colour, showing the first, second, and third period cities as far as have been recovered.

The site of Phylakopi faced the sea to the north, and "stood on a small hillock of limestone with low land to the west, east, and south; on the south-west it was connected by a ridge with high ground further inland. The sea has encroached considerably on the land, and has evidently carried away a large part of the town. The town may have been on the coast, or possibly it was some little distance inland." "Our city appears to have measured about 240 yards from east to west" (J. D. Atkinson, p. 23). Remains of a great fortified wall were found at the westernmost angle of the site, commencing at the sea and extending for a distance of about 230 feet eastwards, protecting the town at a point where the natural configuration of the ground made it comparatively easy of attack. Efforts to trace this wall further eastwards proved fruitless. Some room for discussion evidently exists as to the physical characteristics of the site at the time of its occupation, as Mr. Hogarth (p. 9), referring to the operations in 1898, undertaken to determine the direction of the fortification eastwards, tells that no evidence of a city wall was found at the eastern limit of the

excavated area of the site. "Perhaps this lower eastern half of the town stood less in need of strong mural defence. This supposition can only be justified on the theory that the low fields to the south and east are ancient sea lagoons, dried through the gradual creation of the barrier beach of boulders which now fends off the sea." "The argument which I used in the Preliminary Report (B.S.A. IV. pp. 7, 8), that only on that theory could a sufficient harbour be found for this obsidian exporting centre in early times, is a strong one, and would be conclusive if so much sea-erosion had not taken place (*e.g.* on the west of the town) that the original coast line cannot now be known. The matter cannot at present be lifted out of the region of conjecture."

The great importance of these excavations is told in Mr. Mackenzie's "Introductory" (p. 238): "Since the excavations of the British School at Phylakopi in Melos were brought to a provisional conclusion in 1899, considerable progress has been made in archæological discovery relative to the Prehistoric Age not only in the Cyclades but further afield in Crete. Thus for the Cyclades the important recent explorations carried on by Mr. Tsountas in Amorgos, Paros, Siphnos, and Syros have considerably enlarged our knowledge of the early Cycladic Civilisation which is represented in Melos in the earliest strata of Phylakopi.

"In Crete, again, the remarkable results of the excavations at Cnossos (1900–03) have to be mentioned. Further, we have to notice the important work of the Italian Mission at Phæstos (1900–03), and at Hagia Triada (1902–03), while the British School has also itself taken its full share in archæological discovery in Crete, as at Cnossos and Dicte (1900), Zakro (1901), and Palaikastro (1902–03). Finally, we must not forget the interesting results of the excavations of the American Mission at the Minoan site of Gournia (1901–03).

"At Cnossos, in particular, the range of discovery covered a very wide field, extending from a remote prehistoric era, as yet unrepresented in the results of any discoveries in the Ægean, through a period which has to be correlated with the earliest yet known of in the Cyclades (that represented in the cist cemeteries), to a time when apparently, equally in Crete and in the Cyclades, the Ægean civilisation had reached its prime. Finally, at Cnossos, at Phæstos, and at Hagia Triada, we have, equally with Phylakopi, the completion of the story in evidence of a decadence to which no later renewal of life was ever destined to succeed.

"Meanwhile, discoveries in the mainland of Greece, in Italy, particularly Sicily, and in Egypt, have been extending the possibilities of comparative reference in a wider context. In this connection it is of special importance that the results of the great discoveries made by Schliemann and Dörpfeld at Hissarlik are now available for comparison since the appearance of the monumental work on Troy.

"In view of discoveries like those to which reference has been made, an idea of the importance of the work carried out by the British School in Melos may be gained from the fact that, notwithstanding later discoveries in the Cyclades, Phylakopi still remains, outside Crete, the most important prehistoric site in the Ægean. Indeed, the results of exploration in other islands go to show that Phylakopi will probably remain for a long time, if not always, the typical prehistoric site in the Cyclades. It is the only one yet discovered that exhibits the Cycladic civilisation in all the outstanding phases of its development from the earliest beginnings to the era of the decline."

Before the British Association Dr. Evans gave an address on a preliminary scheme for the classification and approximate chronology of the periods of Minoan culture in Crete from the close of the Neolithic to the Early Iron Age. He held that Mycenæan culture was in its main features merely a late and subsidiary outgrowth of the great Minoan style, when the fine motives of the Late Palace period were already seen in a state of decadence. He divides the Minoan Era into three main periods—Early, Middle, and Late—each with a first, second, and third sub-period. The Late Minoan period from 1700 B.C. to 1100 B.C. The Middle Minoan Age is thrown back to the third millennium B.C. The Early Minoan period middle of fourth millennium B.C. (See R.I.B.A. JOURNAL, August 1904.) As this has been only recently published, the classification may affect somewhat the term Mycenæan as used in this work.

Little of architectural value has been unearthed, and there is no evidence of the existence of any style whatever in the buildings of any of the three settlements whose plans are given and described by Mr. Atkinson. Several more or less complete plans of houses show the general arrangement to have been that of a group of two, three, or four small cells, connected together and entering off one another. Fig. 26 seems to indicate an attempt to give importance to the entrance hall of the house. Fig. 32 shows a house of the second period in which a corridor has been introduced. The lack of steps suggests that they were either of one story or that the stairs were in wood; and, considering the evident lack of masonic skill, the latter theory may carry weight. The only building of any great proportion is the Palace, the foundation plan of which has been recovered. This building belongs to the period of the third settlement, and is interesting as showing the arrangement of the homes of the great as compared with the homes of the common people. Here importance is given by an irregularly shaped courtyard, with a well, and a portico through which the Megaron is reached, but the want of any indication of doors prevents an opinion being formed as to how far the flanking corridors were utilised for

access to the other chambers. The absence of any architectural detail is disappointing. The careless manner in which the building angles have been set out and the irregularity of the extremely narrow alleys do not indicate any guiding rules in the execution of the work. The architecture does not supply any conclusive evidence as to the degree of continuity of the occupation of the town, as the work in all three periods is similar; the rebuilding of each city has been gradual, and seems to have been carried out in a casual and independent manner. No fortification earlier than the period of the second settlement was found, showing that the first settlement was an open town similar to the Minoan cities of Crete. Mr. Atkinson divides the architectural section into three parts—first period (pre-Mycenæan), second period, third period. Of the first period, the remains found were scanty, but the second and third periods have yielded sufficient to enable the streets and houses to be defined, although the proportion of open space to covered area is not clear. The few examples of complete doorways—which Mr. Atkinson suggests were provided with heavy wood frames to support the wall over—show no sign of constructive skill. Walls generally were 2 feet thick, and a style of building with large blocks of basalt headers and thin slabs of limestone stretchers alternately has in some places been used, whether for practical or artistic reasons is not quite certain. Knowing the prevailing horizontal "frieze" treatment in the pottery decoration, it is not unlikely that this surface decoration was inspired by the same motive.

The feeling for surface decoration is again strongly in evidence in the remains of wall paintings described by Mr. Bosanquet, but these show a highly developed phase of decorative art far in advance of any constructive decoration found. The flying fish frieze, discovered in the remains of the second city, is the best example of this section; in colour, composition, and drawing it is the work of a master, and the "slickness" and "go" of it are truly amazing among buildings of such a character. This beautiful little fragment of Mycenæan art measures 23 cm. high, and is a portion of a continuous frieze on a pale yellow ground framed in black borders, separated from the picture by a line impressed in the wet plaster. On the yellow ground are drawn flying fishes, described by Mr. Bosanquet (p. 70). "The composition at the left-hand end began with a fish swooping downward to the right; the space below and to the left is filled by a mass of conventional rocks that limit the whole picture above and below." "The same fish are repeated again and again, darting upwards or downwards with wings now closed now outspread; above and below them a fantastic rocky wall clothed with sponges and sea-eggs. But it is not the mechanical repetition of a stencil pattern; the draughtsman knew how to vary his design in detail without interrupting the rhythmic movement that ran from end to end of it. The general effect of the delicate colouring and lifelike drawing is singularly like that of Japanese paintings of birds and fish." Indeed, as I write, I have before me a reproduction from a Japanese print, the technique and composition of which show identical feeling. A parallel to this fragment was found by Mr. Evans at Cnossos so strongly resembling it that it can safely be claimed as a product of Cretan art. Either imported complete or the work of an imported artist, Mr. Bosanquet thinks it improbable that the remains of this and the other wall paintings found belonged to the earliest days of the city, but that they "belong to the period during which the dominant influence at Phylakopi came from Crete, not from the mainland." The technique is not in true fresco, but in a combination of fresco and tempera.

The chief interest and value of the excavation is centred in the pottery, which has been found in a great unbroken range from the period preceding the first city to the latest period of the third settlement, when native pottery was displaced by imported ware.

Mr. Edgar (p. 80) writes: "From few Ægean sites of the pre-Hellenic period, if indeed from any, has there come a more interesting collection of pottery than from Phylakopi in Melos. The find ranges without any apparent break from the earliest types of the Cyclades to specimens of the latest Mycenæan style. It is true that the earlier period up to the introduction of ware with painted patterns is very imperfectly represented owing to the shattered condition of the material." "But in two respects the Phylakopi find is of capital importance: first, it provides us with an ordered series of pottery extending, we may venture to say, over the whole Bronze Age of the Cyclades; and, secondly, it exemplifies with remarkable fulness the geometric and the Early Mycenæan styles of vase painting as practised in one thriving centre of industry."

Mr. Edgar divides the pottery into four main groups, "shading off into each other, and each of them capable of further subdivision. These are as follows:—

I. (*a*) The more primitive pottery of the cist-tomb class (Sect. 2).
(*b*) The more advanced ware (Sects. 3 and 4).
II. Painted geometric pottery.
III. Local pottery in the Mycenæan style with spiral and naturalistic designs, early period and late period.
IV. Imported Mycenæan pottery.

"The history of the pottery and that of the buildings cannot be correlated with perfect precision, or, at least, I cannot do it, and probably no one that has seen the site would expect it."

Group No. 1 is similar to the pottery found in the primitive cist tombs of the Greek islands. It was found in a layer immediately above the bed rock and belongs to an occupation anterior to the earliest buildings discovered. "The pottery was

hand-made of very coarse, imperfectly baked clay, usually with a burnished surface, red or brown." On account of the fragmentary nature of the Phylakopi finds, the illustrations are from "similar examples from the neighbouring cemetery of Pelos."

Section III. was found in conjunction with the earlier ware, but certainly originated later and was used later. Its shattered state only allows of a description of a few of its characteristics—decoration of impressed patterns, geometric schemes. Most of them bear traces of a coat of black glaze, and sometimes a coat of red or brown glaze. The smaller ware was of fine clay, with sometimes a polished surface. Painted design was found in lustrous paint and many fragments were glazed inside. Section No. 4 was more plentiful and has a lustrous surface, red, brown, or black, and, with some exceptions, the lustre is not produced by burnishing but by some ingredient in the coat. In addition, incised patterns are used sometimes with white filling. This technique is a "prominent feature in the earliest pottery of Egypt, Anatolia, and Europe." The simple forms of these pieces lend themselves to the equally simple lines of the decoration, which, in spite of its simplicity, is used in endless variety, and applied generally in a horizontal motive, its application being varied in sympathy with the form of the pot. (On page 90, last line, read V. 11 and V. 8 for IV. 11 and IV. 8, and on page 91 read V. 8 *a*, *b*, *c* for IV. 8 *a*, *b*, *c*.) "The practice of decorating pottery with a lustrous monochrome coat was in constant use throughout the whole period covered by the Phylakopi finds." The designs of the painted ware of the geometric pre-Mycenæan period were applied in three different methods: 1. Lustrous black on white slip surface; 2. Powdery mat black, of uniform dead blackness, upon a white slip; 3. Surface covered with lustrous coat of black or red and design painted on in white. These three methods were contemporary. As to the exact order of their origin, some difference of opinion seems to exist. In the later phases of this period a tendency to greater freedom in design is noticeable, and representations of garlands or necklaces occur with geometric patterns. This change is of gradual evolution, and there is no distinct line of demarcation between geometric and floral motives. The influence of the earlier incised period is noticed in the brush stippled lozenges and circles in imitation of impressed patterns.

The great variety of beautiful forms of these vases is well illustrated in the plates and drawings, which are well worth the study of students of structural form and the planning of decorative motive as applied to form. In the later phase of this group the increasing fondness for curvilinear treatment is noticeable.

In the pottery of the Mycenæan period freedom in design continues, and birds, fishes, and fantastic subjects are introduced, and naturalistic floral motives are also common. Fig. 114 shows a decided Egyptian influence. The fisherman vase is a "most remarkable piece of painted earthenware": the decoration consists of four figures of men with a fish in each hand, painted in black outline with red filling; the vigorous drawing of the legs is curiously inconsistent with that of the arms and body, and the great eye stuck in the cheek seems to call for some explanation. Figs. 96 and 97 are most beautiful examples of floral decoration, in which natural forms are preserved and planned in a free and decorative manner. Some examples of the later Mycenæan ware show a free mingling of scrolls and floral design, in which a tendency to restraint is in evidence, and are interesting in comparison with figs. 96 and 97. Fig. 112 is an interesting vessel, evidently used as a bath, and numerous fragments of the same class were discovered. It is elliptical in form, and, from the rather vague idea of scale given, it seems to have been about 3 ft. 9 in. wide in its greater axis.

The latest group, called "Imported Mycenæan" pottery, shows characteristics which are quite different from the local ware; the new technique is introduced in developed form. Mr. Edgar writes (p. 146): "We cannot therefore admit that any of the pottery under discussion is of Melian manufacture, except on the assumption that the new technique was introduced from abroad in a perfected form, and that an alien style was imported along with it, which remained entirely independent of the old established local style. The alternative conclusion—the truth of which is taken for granted throughout this article—is that with increasing importation of superior ware the local school gradually declined, until finally all the better painted pottery used in the settlement was brought from elsewhere and nothing was made on the spot except the most ordinary household vessels."

The recent excavations at Crete favour the assumption that it was the centre of manufacture of this mature technique. The evidence of the pottery shows that previous to the "Imported ware period" the potter's art flourished in Melos with all the receptive power and creative impulse of a living art, taking unto itself all with which it came in contact and "recasting" it with a character which was its own, using that influence brought by the wide commercial relationship of the obsidian trade as an active element subordinate to local tradition and individuality. The results of the excavations at Phylakopi and even at Cnossos bear witness to a power of artistic expression which had no comparative expansion in the wider realms of monumental grandeur.

Some examples, as at Plate XXXI. 1, show a most beautiful and perfected style of decoration, and many other fragments of this period are remarkable examples of technique and design.

An interesting series of mat impressions are illustrated in Plate VI. from the bases of some of the pots, which are valuable in showing to some extent the nature of the weaving industry.

Mr. Bosanquet's paper on the obsidian trade gives interesting facts to prove that it was responsible, in great measure, for the prosperity of Phylakopi, and that the subsequent decline of the trade was followed by the abandonment of the settlement.

"The volcanic glass called obsidian has been used in many parts of the world as a material for knives, arrow-heads, and other implements. Melos, being the principal, if not the only, source from which this useful substance could be obtained by the people of the Ægean, seems from very early days to have had commercial relations, not only with the neighbouring islands and the Greek mainland, but with the coast of Asia Minor, and even with Egypt. This regular intercourse and the prosperity resulting from it must have done much to foster the vigorous local civilisation revealed by the excavations at Phylakopi."

Mr. Mackenzie closes his paper with the following: "All the evidence, then, encourages us to conceive the Minoan sea power as a sort of Ægean League, that in the earliest phases of its history may have grown by successive acts of forced absorption into the sphere of influence of the League, but was ultimately established, as was inevitable in the case of island societies, through the sanction of voluntary incorporation, on friendly lines of mutual advantage based on internal economy. Of this Ægean League the finds now indicate that Melos must have been one of the most important members outside Crete.

"We have also seen that the Ægean civilisation, after a long course of development, reached its prime in Crete in the early days of the palaces at Cnossos and at Phæstos, and in Melos in the period of the late second and early and middle third cities at Phylakopi. Thus, if we can take Melos as typical of the probable course of development in other islands, the trend of that civilisation was towards one great period of prosperity which in greater or less degree was a uniform phenomenon all over the Ægean region. But the tendency towards decadence rested upon inner causes, which equally had their operative effect upon the civilisation as a whole. Besides these, however, as we have seen reason to conjecture, there were external causes contributory to the general process of decline which are not to be sought in any one part of the Ægean itself but on the mainland of Greece. The final catastrophe, when it came, was one which submerged the Minoan civilisation of Crete equally with that of Melos, and the final dissolution of the Ægean League and of the hegemony of Minoan Crete was one event with the break-up of the Ægean civilisation as a whole."

ARCH. C. DICKIE.

TAKING OUT QUANTITIES.

Quantity Surveying, for the Use of Surveyors, Architects, Engineers, and Builders. By J. Leaning. Fifth Edition, revised and enlarged. 8o. *Lond.* 1904. *Price 25s. net.* [*E. and F. N. Spon, Ltd., 125, Strand.*]

Although it is now many years since I had to deal personally with "taking out quantities," my interest in that most valuable adjunct to the profession of an architect has lost none of its freshness; and I am of the opinion, shared by many of my professional brethren, that an architect's education is not complete unless it is accompanied by a knowledge of "quantities," the acquisition of which is alike useful to the architect, a protection to his employer, and a check upon the occasional avarice of the builder.

Mr. J. Leaning is well known as a quantity surveyor, and a book by him upon the subject is bound to be well received, particularly when, as in the bulky volume before me, it has reached a fifth edition. The book is described to be for the use of "surveyors, architects, engineers, and builders"; but it appears to me that some of the information given would be better described as for *beginners*. Such elementary items as squaring dimensions and abstracting could well have been omitted in such a book as this, and perhaps more attention paid to other items of detail. For example, on pp. 7 and 53, the level at which digging for trenches, underpinning, &c., commences should be stated; on p. 69—a bricklayer's bill—"brickwork in filling in of openings, including extra labour and materials, cutting and bonding to old"—is taken at *per rod*; but all bonding and drawing toothings should be measured separately, as they may materially affect the price per rod—occasionally one rod may take ten times as much bonding as another. I do not agree with Mr. Leaning (p. 88) that the labour of cutting and pinning ends of timber or stone is about equal to building in; the ends built in must be far cheaper than cutting and pinning.

On p. 184, window linings are billed at per foot superficial; but it is better practice to measure them at per foot run, as the quantity of tongueing and angles is affected by the width. On p. 233, Mr. Leaning has omitted to state that the *weight* of copper should be given. On p. 251 the bill of girders, &c., suggests that the "depths" govern the price. They do to a certain extent, but not for the sections stated; and no mention is made of the width of flanges, an important factor when they are wide. The clause on p. 331 for "taking up or undoing any portion of the work" should have added to it "and making good after same." The paragraph on p. 384, referring to reducing cost of building by reducing its length, should have been more carefully drawn, there being a number of items in the tender not affected by the reduction in length of building, such as stairs, sanitary works, &c. The suggested clause on p. 428, that "no allowance

will be made for loss of profit on omitted work," is unfair to the builder, as he may tender for £10,000 worth of work, and be compelled to execute £2,000 worth at the same rate.

The portions of the book devoted to "prices," "arbitration," and the "law as it affects quantity surveyors" are exceedingly useful, and altogether the work is one which reflects credit upon Mr. Leaning, not only for its general usefulness, but for the patience and time which must have been consumed in its production.

In any future edition Mr. Leaning might with advantage endeavour to enforce the desirability of more *uniformity* in practice; we all know that the methods of some quantity surveyors do not coincide with those of others, and builders must at times be sorely troubled to price many of the slipshod productions termed "Bills of Quantities." The work of the quantity surveyor who thoroughly knows his business is well entitled to praise from all concerned; it saves much trouble and litigation in the end, and deserves full and adequate remuneration. Architects would do well to decline to support the wretched apologies for "quantities" frequently sent to the builders' offices; and qualified quantity surveyors should not be parties to the degrading terms frequently offered them for their work—work demanding scientific building knowledge, severe application, and personal sound judgment and discretion. WM. WOODWARD.

AMERICAN ARCHITECTURE.

American Renaissance: A Review of Domestic Architecture illustrated by ninety-six half-tone plates. By John Wheeler Don, Architect. 4to. *New York*, 1904. *Price* 17*s. in London.* [*B. T. Batsford*, 94, *High Holborn.*]

This is a volume of attractive appearance, and its wealth of excellently reproduced illustrations, some hundred or so in number and all possessing a certain amount of interest, compels more than passing attention. The binding, too, is artistic, and the text is printed with the wide margins beloved of literary connoisseurs; but, unfortunately for the enjoyment of the English reader, the American spread eagle, which is emblazoned in gold on the cover, appears, invisibly it is true, but none the less insistently, on nearly every page. Frankly this is a book by an American architect written for his countrymen, and one is reminded that though art has a common language it speaks in many dialects, each possessing its own individual slang which only the native can fully understand. Hence the English reviewer finds it difficult to appreciate the author's treatment at its intrinsic value, while it seems hopeless to deal adequately with his subject in the few paragraphs of a review when in his opening words he speaks of the "impossibility of doing justice to its magnificence, even in its domestic phase, within the limits of a single volume."

The fact that the book is a *réchauffé* of magazine articles, which the author assures us excited sufficient interest to justify reproduction, need not militate against its claim for a permanent place on the book-shelf of the American professional or layman who wishes to possess a reference book on the history of the Renaissance in his own country. The reflections on art—or architecture rather—will also no doubt appeal with novelty to the American whom the stress of existence has prevented keeping posted with the modern English literature on the subject, but the strictures on Ruskin, "that old fogey," Browning, and others will hardly serve to commend the author's criticisms to the average English reader.

To some of the author's opinions no exception can be taken, as, for example, his opening premise that just so much as domestic architecture departs in an impersonal artificial way from whatever relates to or reflects the associations connected with the institutions of home life, so far it fails. According to our author the home one builds must presuppose, by subtle architectonic expression, that its owner possessed forebears and has inherited heirlooms; and even if this be not the case, for the sake of obtaining the necessary atmosphere we should imagine that such have come down to us with all their associations. "With such preparation," he continues, "it should be possible for every cultivated American to approach the subject of American Renaissance in the true spirit of understanding." We seem to be not unfamiliar with axioms of this kind, and to have met them expressed with more of literary charm.

The author is on less didactic ground when he points out that the American Renaissance differs from the same style in many countries of the Old World in that it has found its expression in wood, the most available material; and we agree with him that the copying of the earlier timber forms in the marble and stone of later and more prosperous times has resulted in the loss of that indefinable charm possessed by the early colonial domestic buildings. Whether this early charm is really indefinable, and whether it may not be expressed in the single word "simplicity," may be matter of opinion; but certainly, judging from the illustrations, it is evident that as the early simple type gives place to the later "Scaramouche"—to use the author's word—so the charm vanishes and the specimens shown become rather examples to be avoided than models to be imitated.

Passing on from the Introduction, we encounter the difficulty of understanding just to which class of his countrymen the author is more particularly addressing himself. If to his brother professionals, it is perhaps somewhat indiscreet to advertise the fact that, in his opinion, very few modern architects are able to give the home feeling which every dwelling-house should possess, and that as a body they build by the cubic foot alone; while if he is

anxious to appeal to possible clients, it is surely equally unwise to refer to them as a class capable of deeming the architect "plumb crazy" who would submit them a house really suited to their needs, and whose only requirement is that every dollar should be made to show. If this is a fair description of the typical American architect and client there would seem to be little hope for the evolution of a worthy architectural American style. Certainly the author admits that he prefers to "score his points" with sarcasm rather than flattery, though this idiosyncrasy is sufficiently obvious to need attention being drawn to it. But sarcasm is a two-edged sword, and its wielder might be well advised to abstain from showing his own solution of problems—*e.g.* the adaptation of the French Château, Plate LXXVIII.—which he implies that his brother professionals are unequal to solving. As to the taste, judged by English standards, of the author who can say, even sarcastically, "I suppose an occasional architect is annoyed past endurance by somebody who comes with an illustration of a particular piece of my work which has appeared in the magazine requesting that my style be copied," we prefer to express no opinion.

The book, as we have said and have endeavoured to show, is so obviously addressed to an American audience, to whom its historical elements should appeal, and on whom its peculiarities might not grate, that we should not have deemed it necessary to have referred to it, even at the present length, were it not that a casual glance at its illustrations might tempt an English student to the extravagance of adding it to his modest library. Were he to do so, we fear he would find that it occupied space which might be more usefully filled. We should prefer to describe it as a book adapted, as the author says of Ruskin's *Sesame and Lilies*, to be taken up from the drawing-room table when one has time to kill. H. A. Satchell.

WROUGHT IRONWORK.

English and Scottish Wrought Ironwork: A Series of Examples of English Ironwork of the best Periods, together with most of the Examples now existing in Scotland, with Descriptive Text. By Bailey Scott Murphy, Architect. Sixty-eight Plates of Measured Drawings, supplemented by seventy-two Collotype Reproductions of Photographs. Imp. fol. Lond. 1904. *Price* £3. 3*s. net.* [*B. T. Batsford*, 94, *High Holborn.*]

The volume by Mr. Bailey Scott Murphy has added one more to the now lengthening list of works on the Renaissance period in England, which up to the last few years had been so much neglected. Now that one or two large works dealing with the period generally have appeared, the amplification by studies of works in the different materials is still more interesting and valuable, and it would almost appear that the English work alone would have given the author ample scope.

However, this book, including the work of both countries, gives a varied selection, though this, perhaps, might have been carried further with advantage by devoting fewer plates to the ironwork of the two houses Belton and Drayton, which alone account for 27 plates out of the 80. The drawings are boldly executed, perhaps a little too boldly for the smaller scale reproductions, which do not look so well as the details, where everything comes out very clearly, and the fully figured dimensions of the parts are most useful. The studies of the iron balustrading to the stone steps at Drayton are helpful. A satisfactory combination of these materials is always a difficult problem.

Of the various gates shown, that to the gravel court is no doubt the finest example. The side gates are especially happy, but those to the east avenue, though quaint, seem decidedly poor both in execution and design, and might well have made way for another example of English work. The ironwork at Belton, which is exhaustively portrayed, is nicely balanced and charming in detail. The standards in the railings to the main avenue, shown on plate 23, and the ramps to the piers are well worthy of notice, being effective but of sober design. The charming examples of college gateways from Cambridge are too well known to need comment: what always strikes one in studying them is the advantageous set-off that they get from stone piers as against those not thus flanked, and constructed throughout in the lighter material. Oxford, too, is a mine of wealth for wrought ironwork, and Mr. Murphy shows us some fine examples. The Clarendon gates are beautiful pieces of work: they show, perhaps, to better effect in the photograph than in the drawing; the wide hatching of the solids and the absolute black of the narrow ribs detract from an otherwise careful drawing.

On plate 52 we get two examples of early work in the gate to Bishop West's Chapel at Ely and the grille at Winchester Cathedral, both of a Gothic character, and showing a fine contrast in the different ways of obtaining a good effect—the earlier example by repetition of one detail, and the other by variation in ornament. From Hampton Court, of course, some examples are drawn, and it is to be regretted that the author did not give us some measured detail of Jean Tijou's magnificent gates on the east front as well as the rails to the two great stairs.

The last few plates on the English work show a collection of lamp brackets, signs, tomb-rails, &c., all of which are full of interest, some—such as the lamp brackets from York [plate 65], and the sign of the bell from Melksham [plate 64]—being particularly charming examples.

The Scottish examples certainly bear out Mr. Murphy's contention of their inferiority to the English work; but they show an entirely different character, and make for more naturalistic forms, of

which rose, thistle, and oak, as used on the staircase at Caroline Park House, are good examples. It is certainly very interesting to compare the types from the two countries: though the Scottish work is much poorer than that south of the Tweed, it is full of suggestion, especially in its freedom of detail. HENRY TANNER, JUN.

LIGHTING SCHOOLROOMS.

The Lighting of Schoolrooms: A Manual for School Boards, Architects, Superintendents, and Teachers. By Stuart H. Rowe, Ph.D. 8o. Lond. 1904. Price 3s. 6d. net. [Longmans, Green & Co., Paternoster Row.]

This treatise, the work of an American, will be found a useful book of reference to those members of the profession called upon to carry out school work, and especially school enlargements, and buildings within the area of our cities.

There is little in Mr. Rowe's work which the expert planner on this side is not already acquainted with. However, even the expert may be able to learn something from Mr. Rowe, and especially from a perusal of the chapters dealing with selection of site, remodelling old buildings, and testing the sight.

The work is published by Messrs. Longmans & Co., and can be obtained for the moderate outlay of 3*s.* 6*d.* ARTHUR H. RYAN-TENISON.

ALLIED SOCIETIES.

GLASGOW INSTITUTE.

Educational Facilities for Young Architects.

The Glasgow Institute of Architects is closely identified with the recently established School of Architecture in Glasgow, which is to hold its classes in the School of Art and the Technical College. The President of the Glasgow Institute, Mr. John Keppie [*F.*], has been elected a Governor of the School of Art, and associated with him on the Governing Body of the School are three other Fellows of the R.I.B.A., all Past-Presidents of the Glasgow Institute.

By a recent enactment of the Court of Session, made on the application of the Governors of the Technical College, the Glasgow Institute of Architects was empowered to elect a representative on the Governing Body of the College. The Institute has appointed one of its Past-Presidents, a Fellow of the Royal Institute, to be its representative, and with him is associated another member of the Institute.

At a conference of the representatives of the School of Art and the Technical College, held on 11th March 1904, a curriculum for a course for a Joint Diploma in Architecture was approved of. At this conference also a course of study in Day Classes, extending over three years, and a similar programme of studies in Day and Evening Classes, to occupy a period of five years, were arranged. It was further agreed that candidates who have satisfactorily attended either of the courses of instruction or of such modifications of those courses as will be published later will be eligible for the Joint Diploma in Architecture of the School of Art and the Technical College after satisfying the Examiners appointed by the two institutions.

The examination in Drawing necessary to enter the Architectural Classes will be: (*a*) ornament shaded, from the cast; (*b*) a study of a plant or a flower from nature. In addition, candidates for the Joint Diploma must pass a preliminary examination in (1) Mathematics, (2) English, and (3) Latin *or* a modern language. The examination in subject 3 may be postponed to any date prior to a candidate's admission to the Final Examination for the Joint Diploma.

In order fully to meet the demands for higher instruction necessitated by this Joint Diploma, the authorities of the School of Art, in conjunction with the Governors of the Technical College, decided to appoint a visiting professor, and the choice has fallen upon M. Eugene Bourdon, B.A., A.D.F.G. M. Bourdon is a Bachelier-ès-Lettres of the Sorbonne, an Architect Diplomé by the French Government, and Lauréat of the Société Centrale des Architectes. From 1896 to 1900 he was Acting Inspector at the Petit Palais of the 1900 Exhibition, and with M. Ch. Girault is responsible for most of the interior decoration of that building. He has worked in New York, where he was associated with Messrs. Trowbridge and Livingstone in carrying out the Astor Hotel. M. Bourdon, who speaks excellent English, commences his duties in Glasgow in October next.

As agreed at the conference at which the Joint Committee was appointed, it is recognised that the teaching of the subject of Architecture throughout must be common to both the School of Art and the Technical College, but that it will be necessarily taught somewhat differently in the two institutions, the more strictly technical side of the subject being dwelt upon in the one, and the more strictly artistic in the other.

The existing Architectural Teaching Staffs both at the School of Art and at the Technical College are to remain as they are at present constituted. Professor Gourlay, B.Sc. [*A.*] continues his work at the Technical College under the new arrangement, while Mr. Alexander McGibbon [*A.*] remains Director of Architecture at the School of Art.

It is expected that the future conduct of the newly organised School will be in the hands of a joint committee composed of representatives from the School of Art and from the Technical College.